

REMARKS

Claim Rejections - 35 U.S.C. §103

Claims 1-6, 13, 19-24 and 31 are rejected under 35 USC §103(a) as being unpatentable over Purks in view of Carlson.

Claims 7-8 and 25-26 are rejected under 35 USC §103(a) as being unpatentable over Purks in view of Carlson and further in view of Official Notice, and further in view of Rhodes.

Claims 9-12, 14, 27-30, and 32 are rejected under 35 USC §103(a) as being unpatentable over Purks in view of Carlson and further in view of Huang.

The Examiner asserts that Purks expressly teaches "cross-talk noise". However, even if Purks is reviewed precisely, it is apparent that the cross-talk noise as used in purks does not include the meaning of synthesis with a signal waveform. In the dictionary (WordNet ® 1.6, © 1997 Princeton University), the cross-talk noise is defined as an unwanted signal via an accidental coupling between transmission lines. According to this definition, it is natural to interpret the cross-talk noise as a signal component which is placed into an original signal waveform by coupling, and it is common sense also to engineers having ordinary skill in the art that the cross-talk noise is used with such meaning. Accordingly, the assertion based on the citation of Purks and the afore-mentioned dictionary that the synthesis of a noise waveform and a signal waveform as recited in claim 1 is incorrect.

The Office Action asserts that Carlson expressly teaches the use of "switching noise". However, if Carlson is reviewed precisely, no such teaching can be found. Therefore, it is incorrect

to assert that "calculated for the individual of the plurality of kinds of noise" as recited in claim 1 is expressly taught by Carlson.

The feature synthesizing with generation timings of the noise waveforms taken into consideration" as recited in claim 1 is not expressly taught by either Purks or Carlson.

The Office Action further cites Carlson and asserts on page 4 of the Final Office Action that the signals that cause the timing problems can be identified more efficiently if "timing filtering, logic filtering, cross-talk attacker filtering, and safety window filtering" are performed, and from this reasoning, it would have been obvious to one of ordinary skill in the art to modify the teachings of Purks with those of Carlson. However, for example, where reflection noise exists, since the influence of it on the signal waveform continues for a long period of time the "timing filtering" has little significance. Instead, there is a demerit in that it increases the processing time. In such an instance if a signal waveform and a noise waveform are synthesized with fidelity with generation timings of the noise waveforms taken into consideration to calculate a noise composite waveform as recited in claim 1, then over-calculation of the noise value can be prevented. Therefore, a signal having noise problems can really be identified much more efficiently than Purks or Carlson. Accordingly, it is incorrect to assert that the invention as recited in claim 1 could have been made by modification of the teachings of Purks with those of Carlson.

In spite of the concise review of Purks, no description relating to the invention as recited in claim 2 is found in Purks, nor any description is found which suggests that the teachings of Purks could have been modified to arrive at the invention as recited in claim 2.

In spite of the concise review of Carlson, no description relating to the invention as recited in claim 3 is found in Carlson, nor any description is found which suggests that the teachings of Carlson could have been modified to arrive at the invention recited in claim 3.

Claims 4 and 5 are directed to checking of the period or the width of a pulse performed using a clock waveform.

In spite of the concise review of Purks and Carlson, there is no description relating to the invention as recited in claim 4 or 5 is found in any of Purks and Carlson. There is also no description suggesting that the teachings of Purks or Carlson could have been modified to arrive at the invention as recited in claim 4 or 5.

Claim 6 is directed to calculation and checking of rising time/falling time performed using a noise composite waveform.

In spite of the concise review of Purks and Carlson, there is no description relating to the invention as recited in claim 6 is found in any of Purks and Carlson. Also, no description is found suggesting that the teachings of Purks or Carlson could have been modified to arrive at the invention as recited in claim 6.

Claim 11 is directed to dynamic displaying on a display section of a variation of a noise synthesis waveform when the generation timing of a noise waveform is changed.

Meanwhile "re-routing" disclosed in Huang relates to a change of a wiring route and has nothing to do with the feature recited in claim 11.

Accordingly, It would have been impossible to arrive at the invention as recited in claim 11 from teachings of Huang.

Claim 12 is directed to an automatic calculation of a damping resistance value with which a correct signal transmission waveform can be obtained, and displaying of candidate part data corresponding to the calculated damping resistance value.

Meanwhile, "re-routing" disclosed in Huang relates to a change of a wiring route and has nothing to do with the feature recited in claim 12.

Accordingly, it would have been impossible to arrive at the invention as recited in claim 12 from the teachings of Huang.

The Office Action asserts that from the disclosure of FIGS. 3 and 4 of Carlson, a skilled person can arrive at checking noise using the distributions of the minimum and maximum values of time axis waveforms as recited in claim 13. However, FIGS. 3 and 4 of Carlson merely show build up waveforms of a signal waveform. Accordingly, it would have been impossible at all to arrive at the invention as recited claim 13 from FIGS. 3 and 4 of Carlson.

Claim 14 is directed to checking of a noise expected value at each clock timing using the distributions of the minimum and maximum values of waveforms. Although Purks and Huang have been reviewed carefully, no description relating to the invention as recited in claim 14 is found in any of Purks and Huang. Also, no description is found which suggests that the teachings of Purks or Huang could have been modified to arrive at the invention as recited in claim 14.

The Office Action asserts that Huang's "re-routing" of the circuit would automatically solve the design problem. However, it is in most cases impossible to automatically solve the noise problem because of an influence of reflection noise and so forth. In other words, the technique of Huang itself in most cases has no significance. Accordingly, it would have been impossible to

arrive at the invention as recited in claim 14 from the technique taught by Huang.

Regarding the meaning of the term "cross-talk", the interpretation of the Office apparently is a broad interpretation as recited in paragraph (1) hereinabove.

Although the terms "timing filter" and "logic filter" are used by Carlson, the term "noise filter" is not used. Accordingly, it is not known what the Office Action intends to communicate with the term "noise filter".

It is common sense that the noise checking signifies discrimination of whether or not a noise problem exists. In contrast, it is apparent that "filter" does not include any meaning of "check", and concise review of Carlson proves that "timing filter" and "logic filter" include no meaning of "noise check" at all.

The Examiner asserts that Carlson teaches that the signal (whose delay varies) with cross-talk is a result of synthesis of the victim and attacker signals. However, since Carlson is completely silent regarding noise synthesis, it is believed that the Office assertion that the noise synthesis as recited in claim 1 could have been invented from Carlson is unreasonable. Naturally, it is unreasonable for the Office to assert that the invention as recited in claim 1 could have been arrived at from teachings of Carlson.

The Office Action asserts that Purks expressly teaches separately generating a noise signal and then injecting it into a victim signal. However, such description or illustration cannot be found from Purks.

Accordingly, it is unacceptable for the Office to assert that the invention as recited in claim 1 could have been made readily from teachings of Carlson and Purks.

Further, since calculating time axis direction distributions of a maximum value and a minimum value with a timing dispersion taken into consideration as recited in claim 13 raises the function of noise synthesis recited in claim 1 to significantly improve the efficiency in noise checking, it is unreasonable for the Office to assert that the invention as recited in claim 13 could have been made from teachings of Carlson and Purks.

The Office Action asserts that Purks teaches synthesizing cross-talk noise. However, although the description of addition (sum) of cross-talk noise is found in Purks, Purks is quite silent of any other noise component.

The description that a signal waveform is synthesized with a noise waveform simply cannot be found in Purks.

Accordingly, it is unreasonable for the Office to assert that the invention as recited in claims 1 and 13 could have been made readily from the teachings Purks.

In finally rejecting the claimed invention, the Office has virtually repeated the 103 rejections same as those asserted in the previous Office action. In response to the comments made between pages 21-23 of the Amendment filed on July 30, 2003, the Office has made certain reactive explanations from paragraph 45 to 51 of the final Office action dated October 6, 2003. Despite of the Office rationalization concluding that "cross-talk" per dictionary definition can be inferred to be a type of signal synthesis, which argument is weak but is not groundless, this conclusion reached by the Office still does not render the claimed invention obvious.

Independent claim 1, as newly amended, has specifically recited:

"synthesizing with generation timings of the noise waveforms taken into consideration the signal waveform and the noise waveforms calculated for the individual of the plurality of kinds of noise to obtain a noise composite waveform which is the signal waveform on which the noise is superposed".

~~Independent claim 19, as newly amended, has also specifically recited:~~

"a noise waveform synthesis section for synthesizing with generation timings of the noise waveforms taken into consideration the signal waveform and the noise waveforms calculated by said simulation section to obtain a noise composite waveform which is the signal waveform on which the noise is superposed; and a noise checking section for performing noise checking based on the noise composite waveform obtained by said noise waveform synthesis section".

It should be noted that independent claim 1 has specifically claimed that the

"synthesizing with generation timings of the noise waveforms taken into consideration the signal waveform and the noise waveforms calculated for the individual of the plurality of kinds of noise to obtain a noise composite waveform which is the signal waveform on which the noise is superposed".

and independent claim 19 has specifically claimed that the

"a noise waveform synthesis section for synthesizing with generation timings of the noise waveforms taken into consideration the signal waveform and the noise waveforms calculated by said simulation section to obtain a noise composite waveform which is the signal waveform on which the noise is superposed; and a noise checking section for performing noise checking based on the noise composite waveform obtained by said noise waveform synthesis section".

In the asserted prior art and the conclusion reached by the Office asserting a dictionary definition, there are no disclosures or teachings that the cross talk which the Office correlates to inherently contain the claimed noise waveform; however, the noise in the cross talk is neither "synthesizing with generation timings of the noise waveforms taken into consideration, as newly amended, the signal waveform and the noise waveforms calculated for the individual of the plurality of kinds of noise to obtain a noise composite waveform which is the signal waveform on which the noise is superposed", as what is clearly claimed in claim 1, nor "a noise waveform

synthesis section for synthesizing with generation timings of the noise waveforms taken into consideration the signal waveform and the noise waveforms calculated by said simulation section to obtain a noise composite waveform which is the signal waveform on which the noise is superposed; and a noise checking section for performing noise checking based on the ~~noise composite waveform obtained by said noise waveform synthesis~~ section", as what is clearly claimed in claim 19.

Given that these and other clearly claimed features are not disclosed or taught in the asserted prior art, even if the asserted prior art are combined exactly as suggested by the Office, the combination would not contain either a "noise waveforms calculated for the individual of the plurality of kinds of noise with generation timings of the noise waveforms taken into consideration", or a "noise waveforms calculated by said simulation section with generation timings of the noise waveforms taken into consideration."

Therefore, the claimed invention is indeed not rendered obvious by the asserted prior art. In the interest of advancing the prosecution of this application, independent claim 1 has been amended by adding thereto:

"when the noise checking is performed, a maximum delay time and a minimum delay time of the noticed wiring line are extracted from the noise composite waveform, and overdelay/racing checking for the noticed wiring line is performed using the maximum delay time and the minimum delay time."

Independent claim 19 has also been amended by adding thereto:

"wherein said noise checking section (6) extracts a maximum delay time and a minimum delay time of the noticed wiring line from the noise composite waveform and performs overdelay/racing checking for the noticed wiring line using the maximum delay time and the minimum delay time."

By so amending, independent claims 1 and 19 are further patentably distinguished over the

asserted prior art. All claims dependent thereon, are also further patentably distinguished over the asserted prior art.

Regarding obviousness rejections, section 706.01(j) of the MPEP has specifically stated that:

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claimed limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 466, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Therefore, it is both a court position and a Patent Office position that to establish a *prima facie* case of obviousness, 1) there **must be** some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; 2) there **must be** a reasonable expectation of success; and 3) the teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be** found in the prior art, and not based on applicant's disclosure.

Therefore, should the Office either be unable to identify each and every aspect of the above-mentioned claimed features after taking full consideration of the asserted prior art in a way exactly applied in the outstanding Office action, or the Office recognizes that the rejection simply does not arise to a level objectively fulfilling all three criteria of establishing a *prima facie* case of obviousness, it is respectfully submitted that the obviousness rejection is defective and allowance

of the claimed invention is requested.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, all pending claims are believed to be in condition for allowance, which action, at an early date, is requested.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 50-2866.

Respectfully Submitted,

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